

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
US Department of Commerce
United States Patent and Trademark
Office, PCT
2011 South Clark Place Room
CP2/5C24
Arlington, VA 22202
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 17 November 2000 (17.11.00)	Applicant's or agent's file reference CSG74189/001
International application No. PCT/GB00/01248	Priority date (day/month/year) 31 March 1999 (31.03.99)
International filing date (day/month/year) 31 March 2000 (31.03.00)	Applicant TRAVIS, Adrian, Robert, Leigh et al

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

16 October 2000 (16.10.00)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

<p style="text-align: center;">The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland</p> <p>Facsimile No.: (41-22) 740.14.35</p>	<p>Authorized officer</p> <p style="text-align: center;">Zakaria EL KHODARY</p> <p>Telephone No.: (41-22) 338.83.38</p>
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REC'D 06 JUL 2001

WIPO PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference CSG74189/001	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB00/01248	International filing date (day/month/year) 31/03/2000	Priority date (day/month/year) 31/03/1999
International Patent Classification (IPC) or national classification and IPC G09G3/00		
Applicant CAMBRIDGE 3D DISPLAY LTD. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 6 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 16/10/2000	Date of completion of this report 04.07.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Noirard, P Telephone No. +49 89 2399 2420 

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB00/01248

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-18 as originally filed

Claims, No.:

1-22 with telefax of 13/06/2001

Drawings, sheets:

1/6-6/6 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB00/01248

☐ the drawings, sheets:

5. ☒ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

see separate sheet

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-21
	No:	Claims	22
Inventive step (IS)	Yes:	Claims	1-21
	No:	Claims	22
Industrial applicability (IA)	Yes:	Claims	1-22
	No:	Claims	

2. Citations and explanations

see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item I

Basis of the report

The amendments filed with the letter dated 13/06/2001 introduce subject-matter which extends beyond the content of the application as filed, contrary to Article 34(2)(b) PCT. The amendment concerned are :

- * the addition in claim 22 of the part : "the thickness variation being such that....as the light travels across the disc". Indeed, this addition cannot be precisely found in the original disclosure and anyway is broader than the original content of page 11 lines 2-18.
- * the addition in claim 13 of the term "or phase".

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1.1 Independent claims : 1 (display), 22 (lens).

1.2 Reference is made to the following documents :

D1: US-A-4 429 421 (LEVY) 7 February 1984 (1984-02-07)

D2: US-A-5 132 839 (TRAVIS) 21 July 1992 (1992-07-21) cited in the application

D3: WO 98 15128 A (TRAVIS) 9 April 1998 (1998-04-09) cited in the application

Note: The references in brackets {..} relate to passages in the present application.

1.3 Claim 22 lacks novelty (Article 33(2) PCT).

2. Since the amended part added in claim 22 cannot be taken into account (see Item I, above), the subject matter of **claim 22** remains not novel (Article 33(2) PCT) because it is anticipated by a simple lens such as a biconvex spherical lens which is monocentric, comprises a circular transparent disc whose thickness varies with radius, and which can be adapted to receive light at the edge (i.e. the annular narrow part adjacent to the border) of the disc (e.g. for low frequency filtering). Moreover, document **D1** (see e.g. Fig. 3) also discloses such a monocentric lens adapted to receive light at the edge of the disc.

3.1 Considering document **D3** as closest prior art with respect to the subject matter of **claim 1**. D3 discloses (see Fig. 4, 6, 7) a flat-panel wide-field-of-view projection display (cf. the abstract) comprising a lens (9); an array of light emitters (1, 18) positioned along the focal plane of the lens (cf. page 9, lines 23-27) so that light rays from each of the light emitters are substantially collimated by the lens in a different direction from its neighbouring light emitters (cf. page 10, line 25 to page 11, line 5); a light modulator (18); and a ray-diverting means (2) for ejecting the collimated light out of the plane of the lens and towards a viewer (cf. Fig. 6).

Hence, the difference with the subject matter of **claim 1** of the present application is that claim 1 comprises a disc-shaped circularly symmetric lens instead of a cylindrical lens (9 in D3) for collimating, in the plane of the lens, the light emitted by the emitters. None of the available prior art teaches such a disc-shaped "monocentric" lens.

Document **D2** (cf. Fig.8a and column 10, lines 21-38), which is closest to this difference, teaches a circularly symmetric lens in the form of a cylinder for collimating the light emitted by emitters (i.e. the lossy optical fibers 84a, cf. p10, line 68). D2's optical element is obviously not disc-shaped and cannot collimate the light in the "plane" of the lens. Filling the gap between this combined disclosure (**D3** and **D2**) and the subject matter of claim 1 would require a further step which cannot be considered to be obvious (adapting the dimensions / shape of the cylinder and maintaining the collimation in the plane of the lens in spite of the aberrations induced by this adaptation).

Therefore, claim 1 fulfils the requirements of novelty and inventive step as requested by Articles 33(2) and 33(3) PCT.

3.2 The dependent **claims 2 to 21** relate to preferred embodiments of the apparatus of claim 1. These claims fulfil therefore also the requirements of novelty and inventive step (Articles 33(2) and 33(3) PCT).

4. The industrial applicability (Article 33(4) PCT) is clearly present for the subject matter of all the claims.

Re Item VII

Certain defects in the international application

1. Independent claims are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate.

Re Item VIII

Certain observations on the international application

1. The subject matter of **Claim 2** (e.g. illustrated by the display comprising a prismatic reflector drawn in Figure 13) appears to contradict the subject matter of appended claim 1, i.e. achieving a flat panel display {see claim 1, line 1}. This contradiction between claim 2 and the description results in a lack of clarity of said claim.
2. Although the wording of claim 1 conveys the impression that the light emitters and the light modulator (both having the same reference number 4!) correspond to different technical parts of the projection display, **claim 10** apparently contradicts this impression by stating that the light modulator is part of the light emitter and so renders the subject matter of these claims obscure. Hence, it has been assumed in this report that claim 10 adds that "each light modulator includes a microdisplay(4)."
3. In **claim 13**, the expression "phase of view" (and more generally any reference to the "phase" of the image) is not clear in the present context and appears not to be supported by the description.

PATENT COOPERATION TREATY

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INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference CSG74189/001	<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;">FOR FURTHER ACTION</div> <div style="font-size: small;">see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.</div> </div>	
International application No. PCT/GB 00/ 01248	International filing date (day/month/year) 31/03/2000	(Earliest) Priority Date (day/month/year) 31/03/1999
Applicant CAMBRIDGE 3D DISPLAY LTD. et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

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☐ None of the figures.

INTERNATIONAL SEARCH REPORT

Intern. Application No.
PCT/00/01248

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G09G3/00 H04N9/31 G02B3/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G09G H04N G02B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 429 421 A (LEVY) 7 February 1984 (1984-02-07) column 1, line 67 -column 2, line 8; figures	22
Y	US 5 132 839 A (TRAVIS) 21 July 1992 (1992-07-21) cited in the application column 10, line 21 - line 38; figure 8A	1
Y	WO 98 15128 A (TRAVIS) 9 April 1998 (1998-04-09) cited in the application abstract	1
A	page 7, line 12 - line 25; figure 4 page 9, line 13 -page 11, line 17; claims 2,3; figure 6	3-7.9, 10,13.20

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

23 June 2000

Date of mailing of the international search report

30/06/2000

Name and mailing address of the ISA

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Authorized officer

Soulaire, D

INTERNATIONAL SEARCH REPORT

Intern al Application No

PC 00/01248

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 3 609 706 A (ADAMSON) 28 September 1971 (1971-09-28) column 6, line 63 -column 7, line 15; figure 4 column 8, line 69 -column 9, line 5; figure 6 ---	1
A	A.R.L. TRAVIS: "The display of Three-Dimensional Video Images" PROCEEDINGS IEEE, vol. 85, no. 11, November 1997 (1997-11), pages 1817-1832, XP000755850 cited in the application figure 4C ---	2
A	WO 95 34014 A (HONEYWELL) 14 December 1995 (1995-12-14) page 5, line 28 -page 6, line 3; figure 1 ---	2
A	Y. AMITAI: "Visor-display design based on planar holographic optics" APPLIED OPTICS, vol. 34, no. 8, 10 March 1995 (1995-03-10), pages 1352-1356, XP000491221 cited in the application page 1353, paragraph 1 : "Design consideration"; figure 1 ---	3
A	TRAVIS: "Autostereoscopic 3-D display" APPLIED OPTICS, vol. 29, no. 29, 10 October 1990 (1990-10-10), pages 4341-4343, XP000148722 cited in the application the whole document ---	14
A	US 5 600 454 A (TRAYNER) 4 February 1997 (1997-02-04) cited in the application -----	

INTERNATIONAL SEARCH REPORT

Information on patent family members

Interr. Application No

PCT 00/01248

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4429421 A	07-02-1984	NONE	
US 5132839 A	21-07-1992	GB 2206763 A, B WO 9007848 A HK 61295 A SG 99694 G	11-01-1989 12-07-1990 05-05-1995 28-10-1994
WO 9815128 A	09-04-1998	AU 4564497 A EP 0929978 A	24-04-1998 21-07-1999
US 3609706 A	28-09-1971	DE 1961703 A NL 6918465 A US 3609707 A	18-06-1970 11-06-1970 28-09-1971
WO 9534014 A	14-12-1995	EP 0763217 A IL 113971 A JP 10501348 T	19-03-1997 08-02-1998 03-02-1998
US 5600454 A	04-02-1997	CA 2113479 A EP 0789853 A WO 9302372 A JP 6509186 T	04-02-1993 20-08-1997 04-02-1993 13-10-1994